ASTI

1996

Annual Report

Advanced Science and Technology Institute
Department of Science and Technology

1996

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HIGHLIGHTS

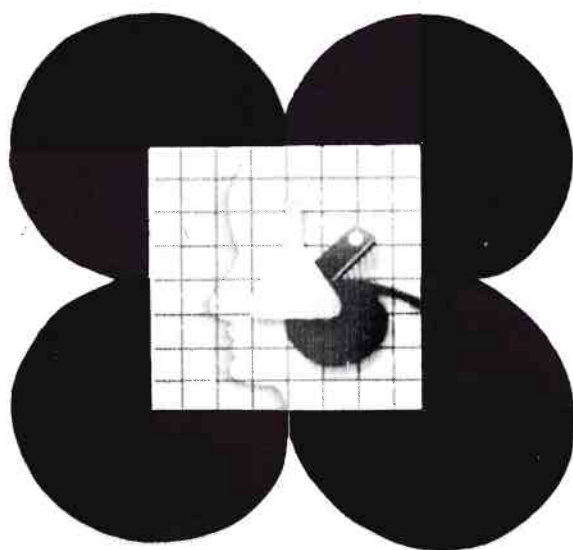1996 saw the Advanced Science and Technology Institute actively pursuing the national development agenda of becoming an NIC. Efforts made were directed at improving technology transfer and capability building to contribute to global competitiveness for the country. All these entailed the development and completion of projects, conduct of lectures, seminars and workshops within and outside the Institute and seizing various capability building opportunities.

Mr. J. Manio and Mr. R. Castillo, S&T Fair 1996 Awardees

abroad. This has made the Institute aware of current trends and situations in advanced technologies, particularly in telecommunications and information technology.

The Institute worked on a total of 11 R&D projects this year. These projects seek to provide economical and practical alternatives to end users and in the process, improve the country's global competitiveness. Projects are largely developmental in nature. Four of them were new, namely ASIC for Telecommunications, 128 kbps Radio modem, 2X6 Line Mini PABX and Wireless TCP/IP Networks. Completed

This year, ASTI reaped some well deserved distinction in various areas. In R&D, two of its projects won coveted awards in the annual Science and Technology Fair held at the Philippine Trade and Training Center (PTTC). In the field of capability building and/or technology transfer, ASTI was lauded for successfully coordinating and conducting various workshops and seminars among them the Third Regional Workshop on Telematics in cooperation with the International Centre for Theoretical Physics. The Institute, with the help of various agencies (i.e. Technology Application and Promotion Institute, Philippine Council for Advanced Science and Technology Research and Development and the DOST) was able to send its staff to several seminars and workshops

An ASTI Staff explains to students the uses of the PABX.

projects include the Development of Telemetry Technologies, Development of a Human Identification System, Hearing Test Equipment, 128 kbps Modem and the 2X6-Line Mini PABX.

Technology transfer activities of ASTI involved the diffusion of information through consultations and the conduct of training programs for both industry and academe. Around 500 clients availed of training programs/seminars conducted by the agency's pool of engineers. These courses include HTML Programming, DSP Theory and Application, VHDL Seminar, Multimedia and Artificial Intelligence. On the other hand, about 3,000 clients benefited from consultancy and information services.

Staff of the CSD assist DOST trainees with the Internet.

To keep up with the dynamic S&T environment, both the administrative and technical staff were supported by the agency to take advantage of various capability building opportunities both locally and abroad. A total of 37 courses offered locally and abroad were availed of. These courses led to enhanced capability and access to new knowledge and/or information among the staff.

ASTI likewise engaged in contract and joint researches to in order to seal ties with the private
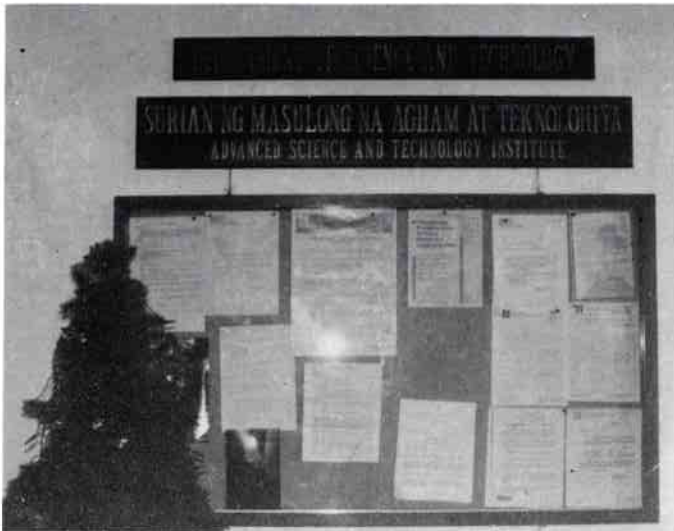

Mr. R. Karnad helps Telematics particpants with their lab work.

sector. Aside from the project on thermal analysis of thin integrated circuit which was continued from 1995, the Development of Up/Down Converter Modules for a Cable TV Telephony System was also a result of this collaboration.

Also worth mentioning is the increasing popularity of the Institute among students and the industry. This may be due to the acceptance of trainees through the Presidential Summer Youth Work Program, participation in various exhibits and the conduct of training programs. Engaging in these activities have proved beneficial because they showcased Filipino ingenuity in the fields of information technology and telecommunications. To date requests for a tour of ASTI's facilities and inquiries for on-the-job-training opportunities have become common.

Overall, 1996 proved to be another opportunity laden year for ASTI, opportunities which ASTI has made full use of. The ASTI in pursuing its goals and mandate has always taken the unconventional route, although it may seem improbable and/or unreasonable, this strategy has allowed the agency to stay dynamic and progressive. It is likely that this year's experiences will serve to propel ASTI into the new century.

ORGANIZATIONAL PROFILE

The Advanced Science and Technology Institute (ASTI) is an attached agency of the Department of Science and Technology established in 1987 through Executive Order No. 128. It is mandated to contribute to the overall national objectives through the conduct research and development work in microelectronics, communications engineering, and information technology. At present, the institute is carrying out projects under four major programs which are aligned with the national development effort to achieve the status of a newly industrializing country.

PROGRAMS AND PROJECTS

High Level Design Automation Program (HILDA)

This program seeks to address the country's need to enter into integrated circuit (IC) design to anticipate performance and size constraints of future electronic products, and for the local electronics industry to become dynamic and competitive.

Rural Telecommunications

Design, prototyping and pilot testing of modern transmission and switching equipment for integration to rural communications systems as well as development and application of wireless technologies constitute the interest of this program.
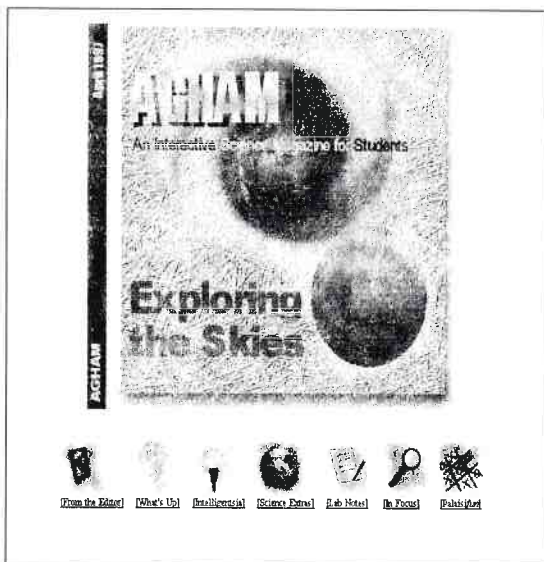
Electronic Fabrication Technology Program

This program's concern involves in-depth study of fabrication technologies consisting of plated-through-hole process, thick film hybrid circuits, multi-layer board fabrication, and surface mount technology. Through this, ASTI helps develop and improve fabrication technologies toward enhancing the performance of local electronics industries.

Multimedia R&D Program

The thrust of this program covers the exploration and adoption of multimedia technologies for increased productivity, efficiency, and global competitiveness of local industries.

Technology Transfer and Training

The concern of this program is to assimilate and eventually disseminate the R&D results of industry, the academe, rural communities, non-government organizations and government instrumentalities. To do so, ASTI engages in joint or collaborative activities such as contract research with industry and the academe as well as initiates/sustains a responsible, technically competent pool of researchers and scientists.

FUNCTIONS AND SERVICES

ASTI is composed of six divisions which are classified as either administrative or technical in nature. Administrative services are extended by the Office of the Director and the Finance and Administrative Division. There are four technical divisions, these are the Computer Software Division, Microelectronics Division, Communications Engineering Division and the Special Projects Division.

The Office of the Director

The OD is tasked with planning and coordination of joint research collaborations, training, seminars and technical services. It likewise monitors, reviews, evaluates and submits research projects to prospective funding agencies, in so doing it promotes and establishes local and international science and technology linkages.

The Finance and Administrative Division

The FAD provides general support and administrative services such as human resource development, property, supply and financial management. It is responsible for coordinating with other government agencies like the Commission on Audit (COA), Department of Budget and Management (DBM) and the Civil Service Commission (CSC). They are also responsible for the maintenance and management of the ASTI library .

The Computer Software Division (CSD)

The CSD is involved in the study and dissemination of advanced software technologies namely digital signal processing and digital media applications such as artificial intelligence. At ASTI, the CSD also oversees the development of the ASTI management information system (MIS) and provides software development support for the other divisions. It is also expected to provide services to the private sector in the interest of promoting advanced software technology.

Efforts are being pooled to realize the massive diffusion of advanced software technology which can assist the local industry in developing more globally competitive software products and services as well as the extensive use of high end technology in applications that cater to the prevailing local problems and conditions.

The Microelectronics Division (MED)

The MED is the organizational arm which fulfills the ASTI mandate to conduct R&D in the area of microelectronics. Its objectives include the conduct of advanced research and development in microelec-

tronics; provision of consultancy and training for both low level and high level design entry for integrated circuits (ICs); and the execution of joint product development through collaborative research with industry and the academe.

Technical services rendered by MED include Application Specific Integrated Circuit Design (ASIC) using a high level design automation methodology.

The Communications Engineering Division

The CED is tasked to undertake researches in the field of communications engineering, the comprehensive development of telecommunications equipment which includes design, fabrication, testing; embedded software programming, real time operating systems, and information systems. It also provides technical and consultancy services and ultimately, to contribute to the emergence of a local communications engineering research capability.

Services offered by the CED include product design and innovations., software and firmware development, product performance evaluation services and electro-magnetic interference performance evaluation.

The Special Projects Division (SPD)

The SPD is basically involved in the study and development of local capability in the fabrication of electronic equipment; the provision of technological support to other divisions of ASTI as well as the local electronics industry; and the promotion and enhancement of local R&D efforts. It also delves into various fabrication technologies and maintains a PCB prototyping fabrication facility.

Services offered by this division include product fabrication which includes tin and tin nickel plating and Printed Circuit Board (PCB) fabrication using plated-through-hole process involving electroless copper plating and copper electroplating.

GENERAL ADMINISTRATION

CAPABILITY BUILDING AND HUMAN RESOURCES DEVELOPMENT

Since ASTI's establishment in 1987, it has remained true to its commitment to spur the country's economic growth through R&D in advanced technologies. This dedication has impelled the Institute to continually enhance, upgrade and augment its staff's capabilities in order to meet the challenges encountered in this dynamic field. The year 1996 is no different.

ASTI is allotted 49 plantilla positions and as of the last quarter, has 42 employees. There are 17 personnel constituting the administrative and support staff. This group basically renders services related to records management, human resource development, personnel & financial matters among others. The technical staff, on the other hand, undertake R&D activities and provide technical related services in different areas of advanced technologies, they comprise more than half of ASTI.

The staff in general cumulatively participated in 41 training activities in fields relating to the administrative and the technical. Each seminar/workshop held either locally or abroad served as a venue to upgrade the knowledge and skills of the staff for better performance in the work place. The Administrative personnel attended several organized functions, among them on quality management systems (ISO 9000); construction monitoring and cost control; newsletter and science writing; government budget administration, audit of expenditures, public personnel administration, cash management control, among others.

ASTI engineers, on the other hand, took part in training and development programs which covered areas in printed circuits, operation of a photoplotter, microwave and remote sensing applications, power and communications equipment protection, error correcting codes and trellis coded modulation, cordless and wireless technologies, telephony, multimedia, etceteras.

As regards formal training, 10 personnel out of the 14 the last year, are till pursuing further studies through the scholarship grant offered by the DOST-Central Office, DOST-ESEP, and DOST-PCASTRD. Of these scholars, 9 are taking up their M.S. Degree in Electrical Engineering and one, in master of Business Administration. Two of the 14 have successfully hurdled their thesis defense and have graduated.

FINANCIAL RESOURCES

For the year 1996, ASTI was appropriated the amount of P50,653,000. Total allotment released amounted to P49,939,880 of which P8,047,507 (16%) was allotted for general administration and support services while P41,892,373 or 84% was set aside for research and development. In addition to this, continuing appropriations from 1995 amounted to P35,395,060.77. Therefore, total available appropriation for the Institute was P86,048,060.

Total obligations incurred by the Institute for the year amounted to P67,436,598 which is 78.4% of the total available appropriation. Personnel services comprised P5,784,344 or 11.6% while MOOE expenses amounted to P8,602,914 or 17.2% of the budget.

Most of the remaining amount will be spent for the design and construction of an ASTI building.

IMPLEMENTATION OF R&D PROJECTS

The Advanced Science and Technology Institute implemented a total of 11 projects this year, of which seven were initiated this year. As of the fourth quarter, eight were completed and three are on-going. Supplementary funding for these projects came from either the Department of Science and Technology (DOST) or the Philippine Council for Advanced Science and Technology Research and Development (PCASTRD) Grants-in-aid.

Generally, ASTI's R&D Program revolve around scientific and technological areas identified by the Science and Technology Agenda for National Development (STAND). Priority areas involve products and services which have high potential in the world market, called Export Winners, it includes computer software and electronic products. Basic Domestic Needs, on the other hand are those that provide infrastructure for growth, in ASTI's case, it centers on telecommunications. Listed below are some of the achievements of ASTI as far as R&D is concerned.
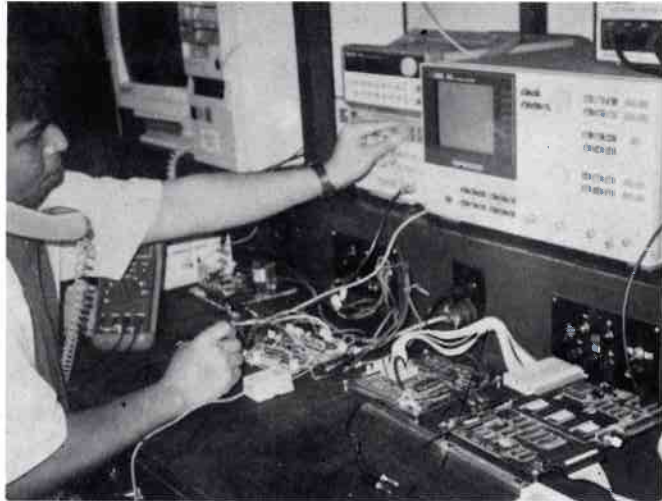
COMPUTER SOFTWARE: EXPORT WINNERS

Development of Digital Signal Processing Technologies for Rural Telecommunications

Project leader : *A. Ernesto R. Tarroza*
Funding support : *PCASTRD-GIA*
Status : *On-going*

The project aims to develop local capabilities for technologies necessary to augment the limited telecommunications infrastructures in the rural areas. The application of digital signal processing (DSP) technology in the fabrication of communications systems is highlighted. Through DSP technology, communication networks are not only equipped with voice but with data communication as well.
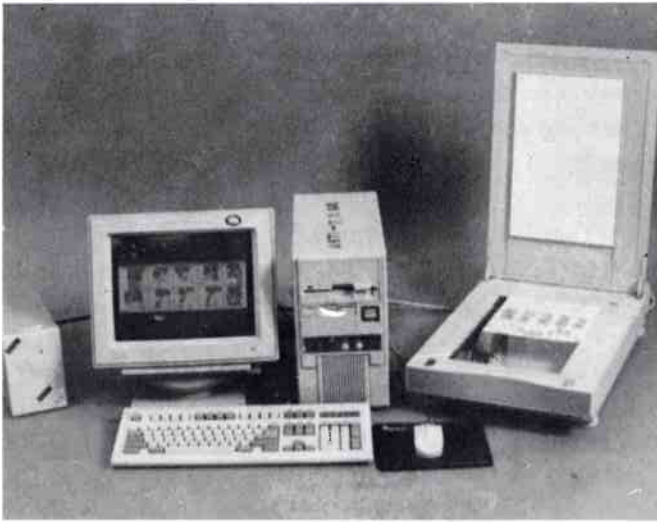
The project will design and fabricate a signaling and services module for the switch subsystem of the rural communications project as well as the design and development of speech/datacompression/ decompression modules for the transmission subsystem.

Development of a Prototype Workstation-Based Human Identification System

Project leader : *Eric Paolo T. Galicia*
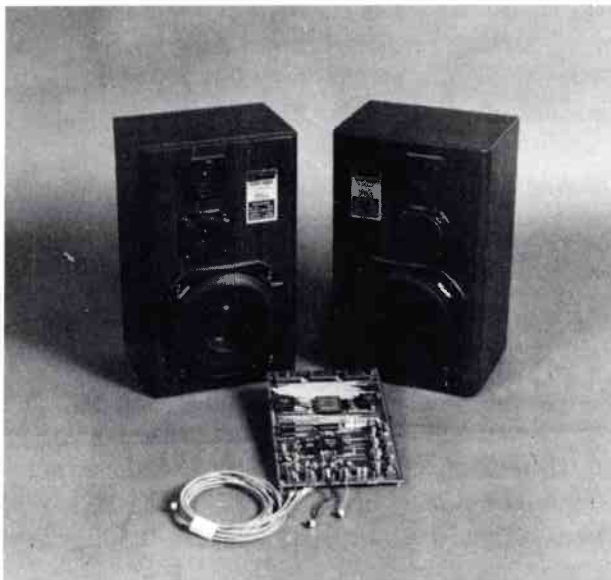*Funding support* : *DOST-GIA*
Status : *Completed*

This project develops a human identification system run on a Sun Workstation and/or an INDY Workstation. The said system will be used to build up a database on people based on their fingerprints and to identify a person via these fingerprints to match with corresponding bio-data. To do so, the following outputs are necessary: an artificial neural-network based fingerprint classification system; an image database and image preprocessor to facilitate recognition; and a library of neural network paradigms and Digital Signal Processing (DSP) techniques on fingerprint analysis. It was completed during the second quarter of the year and has caught the attention of a foreign publication, Biometric Technology Today.

Adaptive Noise Reduction Control

Project leader :.A. Ernesto R.. Tarroza
Funding support : DOST-GIA
Status : On-going

The project aims to develop a DSP-based adaptive noise reduction control system. Initial application of this system would be on the reduction of air-conditioning unit noise. Since research in this area is relatively new, much emphasis is given on the

study and development of various active noise reduction techniques.

Software Simulator and Word Recognizer

Project leader :.Peter Antonio B. Banzon
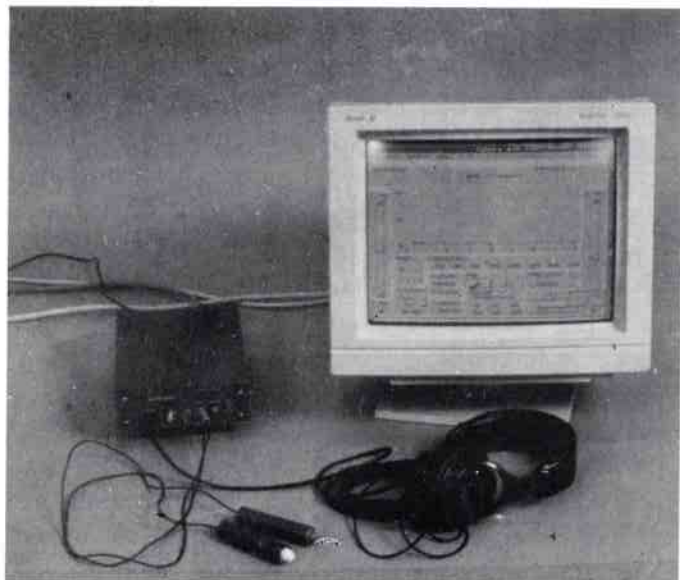*Funding support* : DOST-GIA
Status : On-going

The project involves the development of a speaker independent, isolated word speech recognition system running on a Sun Sparcstation or an SGI Indy as well as a DSP or digital signal processing software library in C which can be used to test and develop various signal processing algorithms. It hopes to see the merger of two technologies, that of neural networks and DSP.

Development of a Prototype Screening Audiometer System : EARTEST SYSTEM

Project leader : Vincent Peter C. Valentus
Status : Completed

The EARTEST is a system developed for the purpose of screening impaired children. It intends to provide a fast, sensitive, cost-effective and readily implementable universal screening procedure for identifying people who exhibit hardness of hearing owing to the dearth of inexpensive facilities for the purpose.

It is basically a PC-based screening audiometer that tests for pure tone air conduction hearing. It tests the functionality of the outer and middle ear of the patient by subjecting the same to a series of sound stimuli. The patient's hearing thresholds to different pure tone stimuli are measured by the system and recorded on an audiogram. The audiogram presents a profile of the patient's hearing from which an examining audiologist can determine if the patient needs a more thorough audiologic evaluation.

ELECTRONICS: EXPORT WINNERS

Development of Thermal Management Capability in Thin Integrated Circuit Packages
Project leader : *Dr. Reynaldo Vea, UP College of Engineering*
Cooperator : *UP College of Engineering*
Funding support : *PCASTRD-GIA & Automated Microelectronics, Inc.(AME)*
Status : *On-going*

The project aims to develop and establish a common service facility for thermal analysis of thin integrated circuit (IC) packages for locally based IC packaging companies. Immediate objectives of the project include the modeling of the thermal characteristics of a 68-pin PLCC IC package which can be used to enhance AME's package capability as well as training a pool of engineers in AME, ASTI and UP on the finite element method (FEM) of analysis as applied to different engineering problems, e.g. stress, fluid, electric-field analyses among others.

ASIC for Telecommunications
Project leader : *Pedrito B. Mangahas*
Funding support : *DOST-GIA*
Status : *New*

The increasing complexity of communication systems brought about by the demand for improved product performance and reliability require the support of microelectronics systems. To be able to develop local telecommunication design capability, there must be corresponding development in microelectronics design capability. This project aims to address this requirement by developing local capabilities for the design of microelectronics circuits and systems specific to telecommunications. It will focus on the development of two circuits namely Circuit 1 which is defined by the Communication Bus Management and Datapath Control ASIC and Circuit 2, which is the Channel Encoder and Decoder ASIC Chip.

BASIC DOMESTIC NEEDS: TELECOMMUNICATIONS

Development of Telemetry Technologies
Project leader : *Rajah Kristian Joseph C. Castillo*
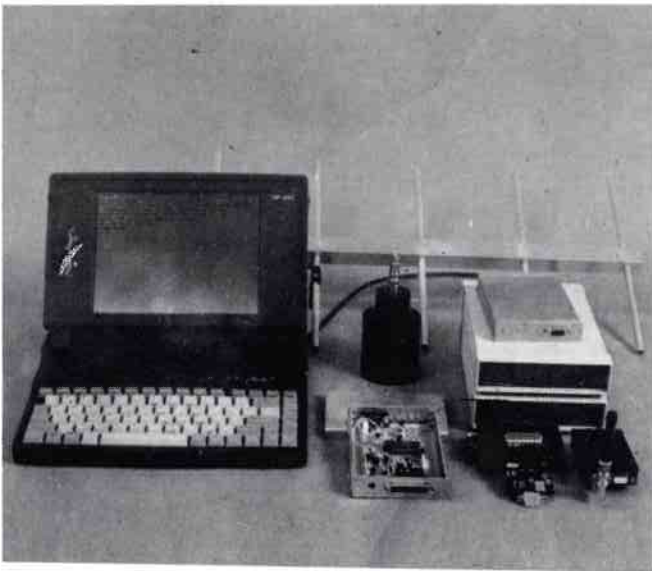*Researchers* : *Roderick Durmiendo, Dhan Rhuayana*
Funding support : *DOST-GIA*
Status : *Completed*

This project aims to provide a variety of telemetry subsystem modules (i.e. transceivers, modems and software protocols) which would be cost-effective and flexible enough to be configured into a particular telemetry system. To do so, the project will design and fabricate different radio transceivers operating on different frequency bands for a wireless telemetry system. Likewise, a the design and fabrication of

modems with different modulation schemes and bit rates will be made. The project was completed as of the second quarter.

As an entry to the National Invention Contest, it was awarded the second place in the Most Promising Creative Research category (TUKLAS Award).

Aside from upgrading local capabilties, the project is expected to develop engineers specializing in microwave electronics design and product development. It will also develop front-end circuit modules for weather satellite receivers and software that will enable the ground station to decode and process weather satellite data.

Development of Satellite Receiver Technologies
Project leader : Raymond Gerard O. Ambrosio
Funding support: PCASTRD
Status : On-going

The development of this project is aimed at enabling the country to take full advantage of the vast information handling capability of weather satellites. To do so, the project seeks to design and fabricate subsystems locally. In so doing, accurate and timely information can be obtained and processed for local needs immediately.

128 kbps Radio Modem
Project leader   : *Rajah Kristian Joseph C. Castillo*
Researcher   : *Jordan Orillaza*
Funding support   : *ASTI*
Status   : *Completed*

The High Speed Radio Modem is designed for use as a data communication bridge that will connect a wireless local area network (WLAN) with the ordinary wired LAN. With the widespread use of high speed computing coupled with the increasing demand for networking, this technology will speed up
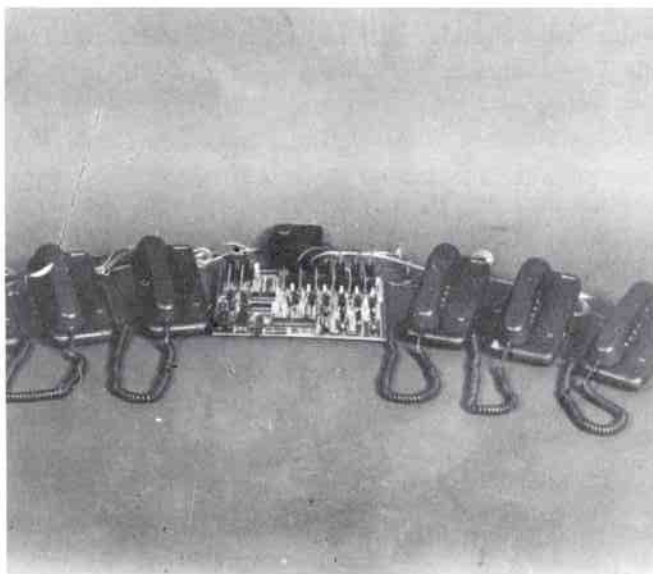
transmission of massive data. The equipment is composed of two (2) separate modules, the MODEM and the Transverter. These modules convert digital data to and from transmission--ready RF signals, at a beating speed of 128,000 bits per second. With this much capacity, any digitized information such as voice (or even video) In a high capacity trunk line can be easily handled.

The project was entered in the National Invention Contest held during the 1996 Science and Technology Fair of the Department of Science and Technology and qualified as a finalist.
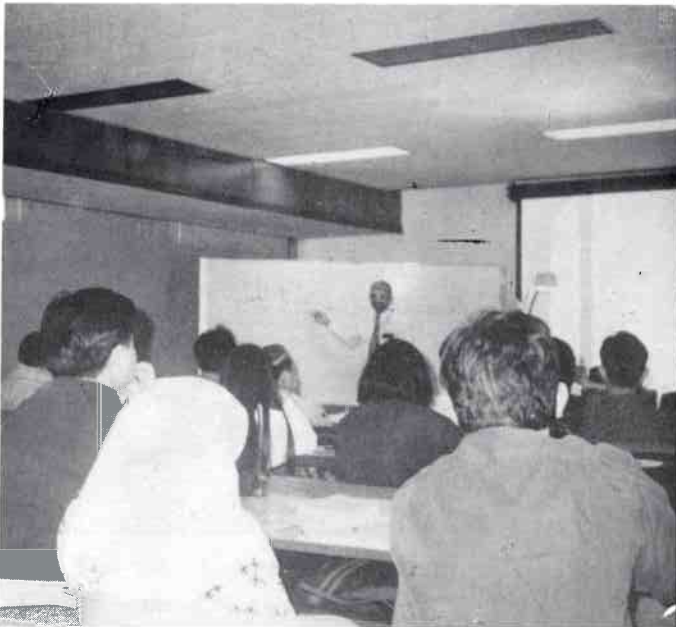
2x6 Line Mini-PABX

Project leader   : *Denis F. Villorente*
Researchers   : *Jesus C. Manio, Erville*
                   D. Magtubo
Funding support   : *ASTI*
Status   : *Completed*

The 2x6-line mini-PABX is a stand-alone switching unit with a maximum capacity of two(2) trunk-lines (CO lines) and six (6) local lines. It consists of five(5) functional modules namely the switching module, microprocessor, line interface, tone generator, and the power supply module. The system has been developed for small businesses and residences and serves as a cheaper alternative to a full-sized PABX which is more expensive especially for businesses with a small set up. The mini-PABX boasts of the following features and capabilities: direct inward dialing, call transfer, camp-on call, call diversion, trunk request , music on hold, station to station calling, assigned extension ringing, answers incoming call on the first ring with customized greeting.

An entry in the 1996 National Invention Contest, it was awarded the third place in the Most Creative Research category. Through this technology, ASTI hopes to provide alternative means to improving communication specially in the rural areas.

SERVICES OFFERED

S&T EDUCATION AND TRAINING

ASTI conducted 22 training activities over the year drawing close to 500 participants from various sectors. An indeterminate number of people ranging from students (both high school and undergraduates), to members of the academe and industry benefited from these courses. Most of the courses conducted were lectures with some practical application, it was discovered that this was the most effective means of sharing technical information. Courses conducted were as follows :

First Quarter (January-March 1996)
* *Internet Briefing Seminar*
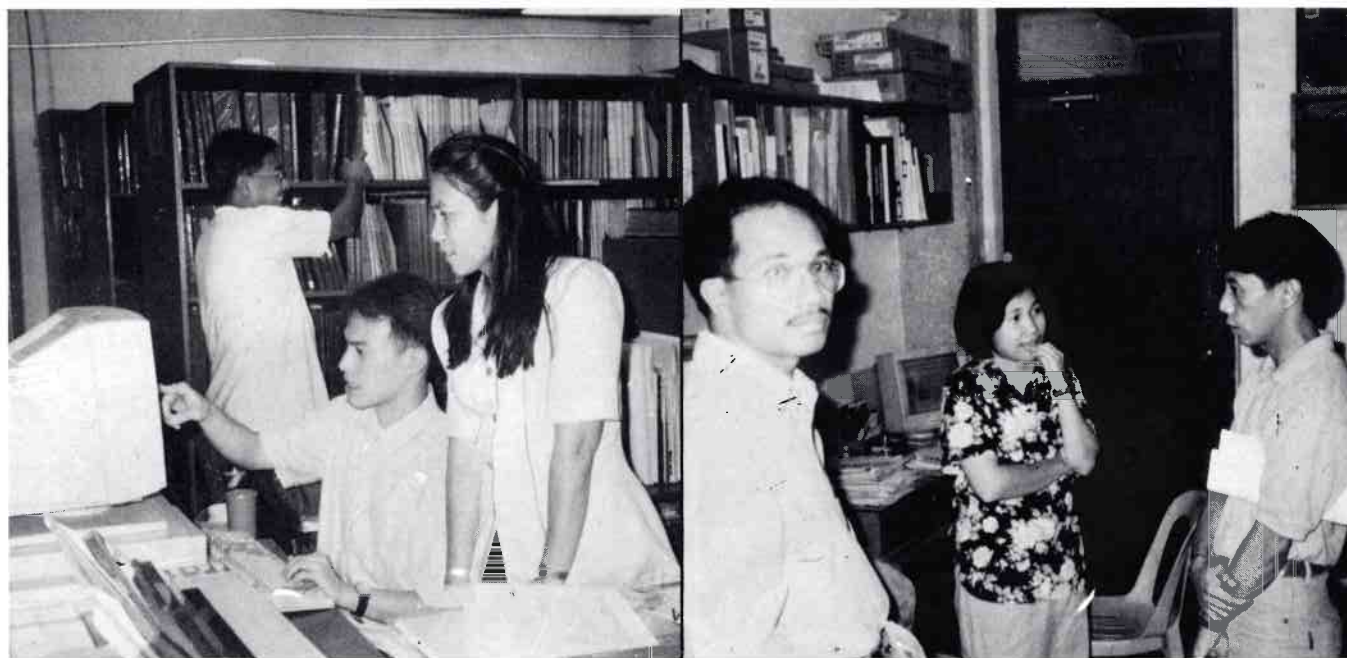* *Basic Networking Operations*

Second Quarter (April-June 1996)
* *Internet Briefing Seminar*
* *VHDL Seminar*
* *Digital Signal Processing and Applications*

Third Quarter (July-September 1996)
* *R&D Training Program in Electronics and Information technology*
* *HTML Programming*

Fourth Quarter (October-December 1996)
* *Seminar on Artificial Intelligence*
* *3rd Regional Workshop on Telematics*
* *Beyond SDL : A Mini-Course on Design Calculi for Telecommunications with UNU-IIST*
* *Introduction to the Internet*
* *Multimedia*
* *Modem Design and Digital Receiver Architectures*
* *CHiPPS : Development of a Data Parallel Computer*
* *Reliability Metrics in Estimating Moving Objects with JSPS*
* *Product Design and Development*
* *Radiowave Propagation Seminar with JSPS*
* *R&D Training Program in Electronics and Information Technology for Students*

CONSULTANCY AND INFORMATION SERVICES

In addition to training programs, ASTI also provided consultancy and information services. About 3,000 clients benefited from the expertise and experience of ASTI's technical staff while around 100 consultations were extended to both individuals and organizations. Majority of them focused on technological requirements of various academic institutions like U.P. Diliman, U.P. Los Baños, Ateneo de Manila University, De La Salle University, University of Sto. Tomas, Pamantasan ng Lungsod ng Maynila and other state colleges. Some private companies/institutions and government agencies also sought the assistance of ASTI. Areas of concern and/or points of discussion revolved around ASTI programs and projects, Internet and network applications, data acquisition systems, equipment evaluation, fuzzy logic, PCB fabrication, fiber optics, PABX, radio modem, among others.

The ASTI library continues to draw information seekers due to its well stacked shelves and user friendly set-up. The library has dispensed with its card catalogue because it has developed a book database system using the CDS-ISIS software. This system displays the data in card catalogue format and allows users to locate books and other pertinent information with just a few taps on the keyboard. Records show that the ASTI library subscribe to 30 magazines, 24 of which deal with communications, computer software and/or electronics. These include PC World, Computer Telephony, Integrated System Design, Popular Electronics and Dr. Dobb's Journal. Aside from these, ASTI makes sure its collection is updated keeping in mind the pace of development in the field of advanced technologies. This year, a total of 256 books were purchased to complement the various journal subscriptions in order keep up with the demands of its clients.

The ASTI also came up with several informational materials disseminated basically to promote the Institute. Two new brochures, the ASTI Organizational Brochure and the ASTI Project Brochure were made and disseminated primarily during the 1997 Science and Technology Fair. Three issues of the ASTI newsletter CURRENTS which highlight activities and developments of the Institute were published. Other materials include the annual report, brochures on seminars or projects, manuals, project details, travel and terminal reports.

DEVELOPMENT OF S&T MANPOWER AND INFRASTRUCTURE

ASTI conducted a total of 22 trainings ranging from short to full blown courses during the year. These were attended by college and high school students, faculty, industry people, academe people as well as government employees. Below are some of them :

* DSP Theory and Applications (April 17-19, 1996)

The course sought to give an introduction of Digital Signal Processing (DSP) to those who might find interest but have very minimal knowledge of the field. Target audience are students, teachers, technical managers and engineers who have very limited DSP exposure. The course gave participants an overview of the field of DSP : basic concepts, possible applications and available tools. The course integrated some hands-on exercises to complement the lectures. Of the 14 participants, three were form the academe and the rest were engineers.

* R&D Training Program in Electronics and Information Technology For Students (July 1, 1996 to June 30, 1997)

ASTI for the past several years has been involving college students in its various R&D programs. This project funded by the Department of Science and Technology - Grants-in-Aid formalized this set-up in order to provide students with training and hands-on experience in the actual implementation of R&D projects in the advanced fields of electronics and information technology.

College students from various universities in Metro Manila were encouraged to join. During the first half of the project, 34 students were hired as student assistants to work with various projects being implemented in ASTI's technical divisions. They were asked to do system design, system fabrication, system integration, system implementation, programming and PCB fabrication. The projects included the Human Identification System, Wireless Networking, Printed Circuit Board (PCB) Fabrication, Assembly and Testing, Hearing Test, Fabrication of Microwave Transceiver and Radio Modem.
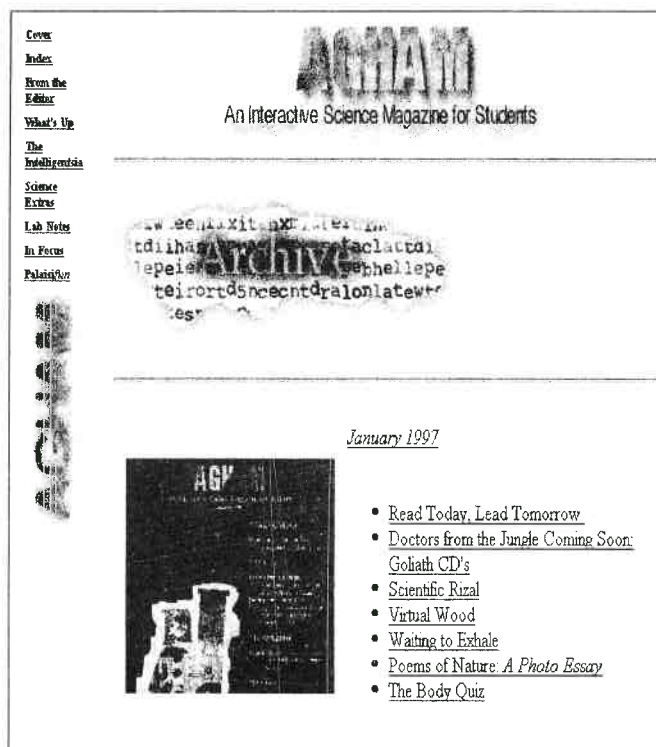
Based on the evaluation given by the participants of the first phase, it was discovered that they benefited tremendously from the project. Majority of them have expressed their willingness to participate in future research undertakings of the Institute. They cited favorable work environment and worthy R&D activities as reasons. As of December 1996, there are 9 participants to the project.

* HTML Programming (September 1996 to April 1997)

This project, funded by the United Nations Educational, Cultural and Scientific Organization (UNESCO) in cooperation with the Science Education Institute (SEI) and spearheaded by the Computer Software Division, enabled high school students to come up with an Interactive Science Magazine which will be seen by the whole world via the World Wide Web.

The project involved the training of 20 high school students selected from the Manila Science High School, Quezon City Science High School and the Philippine Science High School on web authoring and the use of hyper text mark-up language (HTML) which are tools for making web pages. The training

included hands-on activities, lectures and an introduction to the Internet and the World Wide Web. Each of the schools were given free book on HTML, copies of the training materials used and the necessary software (e.g. Netscape Navigator, Word Internet Assistant and clip art images) in order to facilitate work of the students.

The science magazine is a multi-lingual, bi-monthly interactive science magazine which contains science topics timely and relevant to local events. Its objectives include updating the general public on the developments of S&T and to familiarize end users with information age tools. Ultimately, the management of the magazine will be turned over to the schools/students. The magazine called AGHAM is now posted on the Internet and can be viewed at <http://www.asti.dost.gov.ph>.

* VHDL Design Seminar
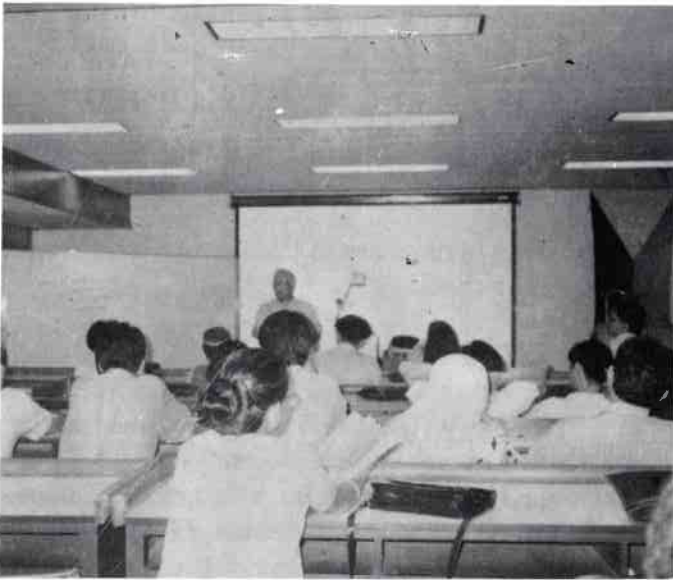## (October 21-25, 1996)

The seminar aimed to introduce the participants to a high level design automation methodology which can be used in the design and implementation of Application Specific Integrated Circuits (ASICs). The course put special emphasis on teaching fundamental VHDL concepts that serve as the backbone of this design methodology. The target participants were Engineering Science Education Program (ESEP) faculty of universities which do not have a formal microelectronics course in their curriculum.

The VHDL Seminar had three parts namely High Level Design Overview, VHDL concepts and Design Implementation. There were a total of 11 participants, 7 of them were faculty and the rest were students. Based on the evaluation, most of the participants were able to execute the exercises given them and did fairly well. The lecturer Mr. Pedrito Mangahas reported that each school (De La Salle University, University of San Carlos, St. Louis University and Pablo Borbon Institute of Technology) received one Xilinx FPGA Memo Board designed by Mr. Sherwin Waje, a MED staff.

* Third Regional Workshop on Telematics
(November 11 to December 6, 1996)

ASTI in cooperation with the International Centre for Theoretical Physics (ICTP), the United Nations University (UNU) the Department of Science and the Technology and Technology Application and Promotion Institute, hosts the Third Regional Workshop on Telematics.

The Telematics Workshop aimed to upgrade technical capabilities of engineers, scientists and fac-

ulty members of telecommunications companies, research agencies and academic institutions in ASEAN countries. It focused on the fundamental aspects of communications and computer technologies. To achieve these, lectures as well as laboratory exercises were incorporated in the program. A total of 41 participants from India, Pakistan, Philippines, Vietnam, Indonesia, Malaysia and Thailand attended the workshop. They benefited from the expertise of 13 lecturers and laboratory instructors from Chorus Systems in Tokyo, Center for Development of Telematics in India, Motorola, Ltd. In England, the University of the Philippines, ASTI, Tata Institute of Fundamental Research in India and the University of Missouri-Kansas City in the United States.

Spearheaded by the Communications Engineering Division, the Telematics Workshop successfully achieved its objectives. The favorable outcome of the endeavor prompted Prof. M.V. Pitke, Course Director to use the Philippines as a model in bringing the Telematics to other countries.

* Beyond SDL : A Mini-Course on Design Calculi for Telecommunications (December 2-3, 1996)

The course was organized by the ASTI in cooperation with the United Nations University/International Institute for Software Technology (UNU/IIST) to promote research into format design calculi oriented techniques for software development in telecommunications and to explore plans for joint work in the DesCaRTes programme.

The course which was conducted by Prof. Kees Middelburg complements the UNU/IIST Research and Training programme DesCaRTes, which focuses on formal techniques and tools to complement SDL for more rigorous approaches to software development in Telecommunications. The course was attended by participants from various universities and organizations (i.e. Mindanao State University, Pablo Borbon Memorial Institute of Technology, Adamson University, De La Salle University, University of the Philippines, among others).

Prof. Middelburg is a senior fellow at UNU/IIST in Macau whose present interest is in the rigorous development of embedded software for reactive and distributed systems, focusing on formal techniques and tools, to complement SDL.

SCIENCE AND TECHNOLOGY LINKAGES DEVELOPED

Establishing linkages and collaboration with various sectors is consistent with ASTI's role as an instrument of the government to realize the vision of Philippines 2000. The Institute finds these endeavors an effective means of transferring completed researches to end users and conversely, securing their support.

Linkages established with international and local organizations have been very vital to the activities of ASTI. Collaboration with the International Centre For Theoretical Physics (ICTP) in Itlay resulted in the signing of a Memorandum of Understanding (MOU) to carry out collaboration in the field of wireline and wireless data communications networks, development of network technology package solutions for rural applications, and conduct of radio propagation measurement and studies. Another collaborative effort undertaken with ICTP though Dr. Madhukar V. Pitke was the Third Regional Workshop on Telematics. The workshop highlights the establishment and
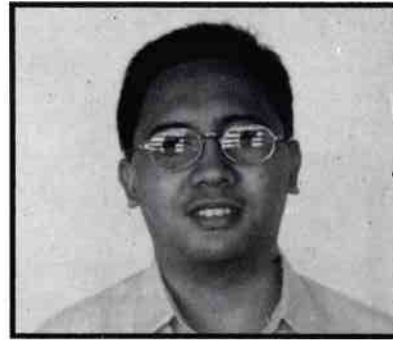

Lecturers of the Telematics Workshop with Prof. Romeo Solis (center). From left, Dr. E. Abaya (UP), Dr. J. Agrawal (USA), Prof. R. Solis (ASTI), Engr. M. Periasamy (CDOT) and Mr. R. Karnad (India)

strengthening of programs in telecommunications and information technology.

ASTI also maintained its ties with the United Nations University - International Institute for Software Technology (UNU-IIST) which resulted in the conduct of a course entitled Beyond SDL : A Mini-Course on Design Calculi for Telecommunications. The course sought to propagate research into formal, design calculi oriented techniques for software development in telecommunications. Another significant achievement by the Institute is the Interactive Science Magazine which was made possible through the support of the United Nations Economic, Scientific and Cultural Organization (UNESCO). This project allowed ASTI to develop aptitude and competence of high school students in web authoring and HTML.

Collaborations with the following agencies were carried out : DOST agencies (e.g. Technology Application and Promotion Institute, DOST Central Office), Bureau of Patents, Technology Transfer and Trademarks (BPTTT), Technological Institute of Japan, the National Post Harvest Institute for Research and Extension (NAPHIRE) and the municipal government of San Luis in Aurora province.

Collaboration also take the form of contract or commissioned researches. This are undertaken by ASTi in response to the needs of the local industry, academe and other clients/beneficiaries. For this year, ASTI inked a deal with two local companies. One is with the Micrologic Systems, Inc. to Develop a Wireless Remote Control Receiver/Decoder and the other with GHT Network, Inc. for the Development of Up/Down-Converter Modules for a Cable TV - Telephony Systems. Both projects were implemented by the Communications Engineering Division.

ANNEXES

KEY OFFICIALS

PROF. ROMEO G. SOLIS
Director

ENGR. A. ERNESTO R. TARROZA
Chief, Computer Software Division

ATTY. CARMENCITA M. ECHANO
Chief, Finance and Administration Division

ENGR. VICTORIO EMMANUEL A. OCHAVE, JR.
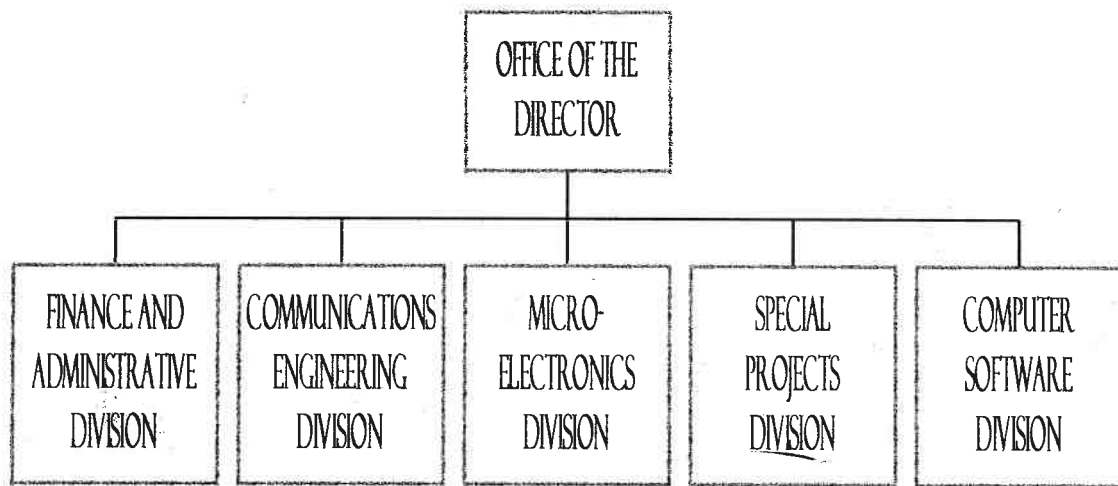*Chief, Communications Engineering Division*

ENGR. CAROLINE C. PIMENTEL
Chief, Special Projects Division

ENGR. PEDRITO B. MANGAHAS
Officer-in-charge
Microelectronics Division

ORGANIZATIONAL STRUCTURE

Advanced Science and Technology Institute

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                        ┌──────────────┐
                        │ OFFICE OF THE│
                        │   DIRECTOR   │
                        └──────────────┘
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| FINANCE AND ADMINISTRATIVE DIVISION | COMMUNICATIONS ENGINEERING DIVISION | MICRO-ELECTRONICS DIVISION | SPECIAL PROJECTS DIVISION | COMPUTER SOFTWARE DIVISION |

ASTI STAFF

⊂ The Office of the Director

(left to right, standing)
Marie Angela Singian and Emma Pagador.
(left to right, seated)
Fatima Magtibay, Juvilyn Castañeda and
Marylou Rubillos.

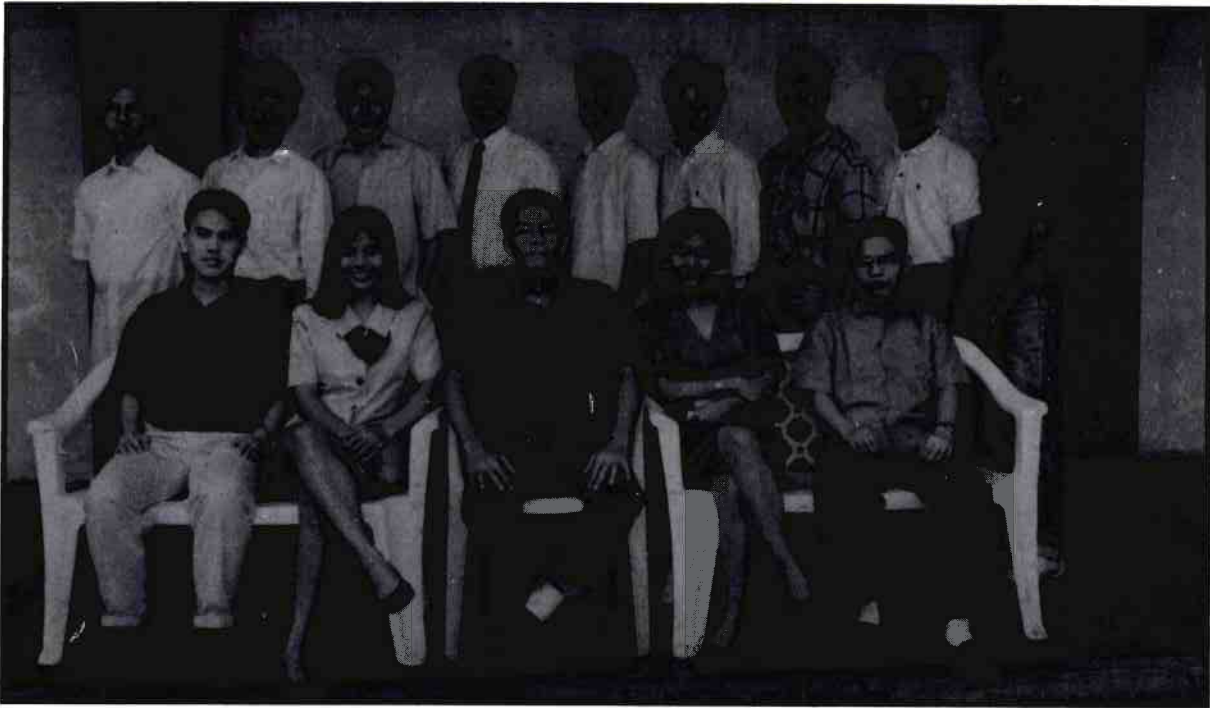## ↻ The Finance and Administration Division

(left to right, standing)
Wilson Bautista, Fernando Calso, Danilo
Hapin, Jose Agustin, Efren Cabotaje,
Ariel de las Alas.
(left to right, seated)
Antoinette Quintos, Aurora Timbangcaya,
Carmencita Echano, Milites Dimaano.

❶The Communications Engineering Division

(left to right, standing)
Denis Villorente, Richard Olesco, Rajah Christian Joseph Castillo, Victorio
Emmanuel Ochave, Jr., Renato Catinguil, Roderick Durmiendo, Joselito Layno,
Vicente Dagupon and Alexander Asis.
(left to right, seated)
Johann Ong, Mia Antonio, George Mesina, Ma. Lourdes Trinidad and Louis Agustin.

❶The Microelectronics Division

(left to right, standing)
Pedrito Mangahas, Romelito
Fajardo, Sherwin Waje and
Manolito Carpio

(left to right, seated)
Aileen Deoma and Celeste
Liceralde

❶The Computer Software Division
(left to right, standing)
A. Ernesto Tarroza, Reuben Ravago, Eric Paolo Galicia, Peter Banzon, Emmanuel Lagare
(left to right, seated)
Precy Obja-an, Emily Pagador and Ma. Cristina Andraneda.